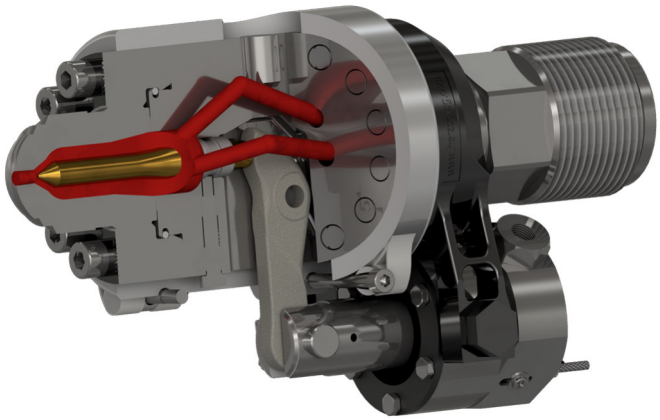
Machine nozzle with needle shut-off type HP pneumatically or hydraulically controlled



Applications:
Thermoplastics (not applicable for PVC)

Shut-off mechanism:
Needle shut-off with integrated 2-way actuator
pneumatically or hydraulically operated

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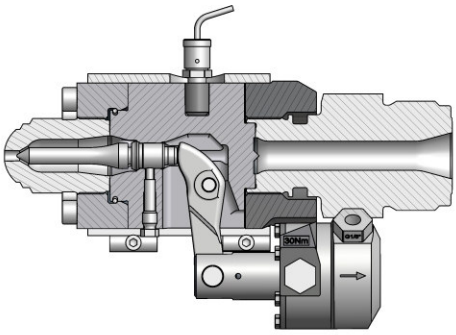
Machine shut-off nozzle, type HP



Technical description

The pneumatically or hydraulically actuated machine needle shut-off nozzles type HP are used in processing of thermoplastics, principally with low viscosity materials such as: PA, PPS, PE, POM,PP.

In this nozzle's favour are:
Cycle time reduction, shut-off at the nozzle orifice, dosing with retracted injection unit.

Finds application in:
Packaging, automobile and leisure industries, medicinal and electronic equipment.

Operation:
The assembly integrated actuator (pneumatically or hydraulically activated) controls a nozzle-axis positioned needle via a lever mechanism. The melt flow is therefore process independently separated at the nozzle orifice. The needle mechanism is designed in such a way, that with over-pressure an automatic opening of the nozzle is ensured.

Modules for filters, mixers and GAIM-applications expand the range of HP nozzles further.

Note:
Values and measurements in this documentation refer to standard applications.

Highlights:
- Melt flow separation at nozzle orifice
- Operating pressure: 3000bar at 400°C
- Proven shut-off with high-speed units
- Robust, reliable separation
- Suitable for special applications
- Compact, interchangeable design

Advantages of needle shut-off type HP

Prevents:
- Stringing
- Material leakage when dosing with a retracted injection unit
- Material leakage while vertically injecting

Applicable for special applications such as:
- Physical and chemical foaming
- Melt pre-compression
- Multi-component

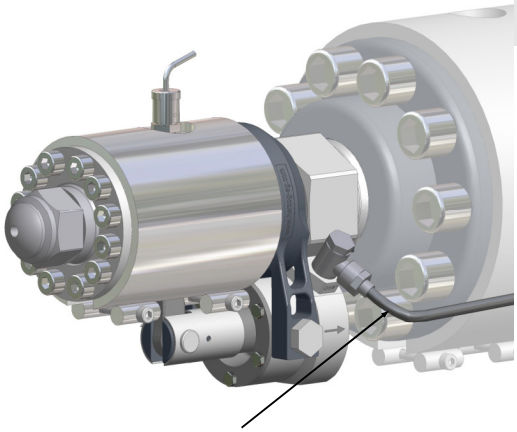
Supported process control:
- Actuator piston position sensors (indicates if nozzle is "open" or "closed")

Productivity factors:
- Controlled, clean melt stream shut-off
- Shorter cycle times - increased productivity
- Increased process reliability and repeatability
- Usability with increased back pressure - improved homogenization

Options:
- Filter module
- Mixer
- GIT
- Process monitoring with piston position sensors on the actuator

What speaks for Herzog

- Nozzle activity is the core business
- Many years market presence
- Design and assemblies matching today's requirements
- Development of special applications
- Fast delivery
- Service performance



Important: Use a flexible cylinder supply!
- Air connection G1/8“
- Oil connection G1/4“
- Water connection G1/8“

(See **Optional Extras, Flexible Actuator Supply**)

Integrated Actuator

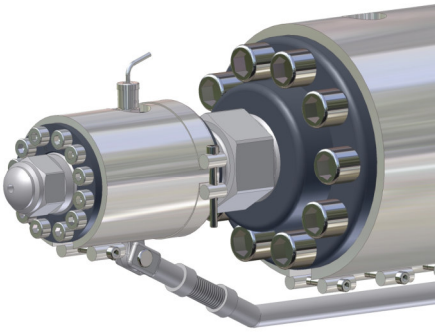
Specially manufactured two-way piston cylinders with temperature resistant seals (up to 180°C) are used in the pneumatic and hydraulic actuators. The actuator together with the nozzle assembly forms a compact unit.
The cylinders are operated from input data on the machine control unit.

Advantages on an integrated actuator:
- No installation errors
- Adjustments such as; stroke, force, etc. on the control unit are eliminated
- No alignment between nozzle and cylinder is required

Actuator settings (acc. to usual energy sources):
- Pneumatic: 5 - 10 bar
- Hydraulic: 40 - 70 bar

Water cooling on the hydraulic cylinder
Heat conduction from the nozzle warms the cylinder. To ensure the hydraulic oil does not degrade, the cylinder temperature should remain between 20 - 60°C.

Cylinder supply:
Cylinder supply length and cross-section can influence the speed of the shut-off mechanism!

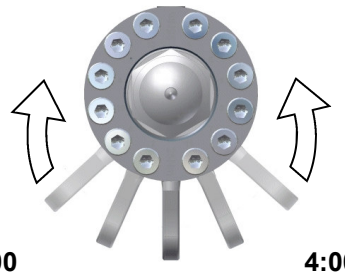


Machine-side actuator

If a machine-side actuator is to be used, the lever installation and connection (range, force and alignment) with the nozzle must be carefully carried out.
For a smooth, trouble-free operation, the following requirements must be met:

Two-way actuator:
- Max. force on lever: **HP0** = 800N, **HP1** = 900N, **HP2** = 2000N
- Min. cylinder range: **HP0** = 18mm, **HP1** = 20mm, **HP2** = 26mm

← 360° →



Assembly alignment

The actuator position is rotational within 360°.
Proven and tested between 4 and 8 o‘clock.

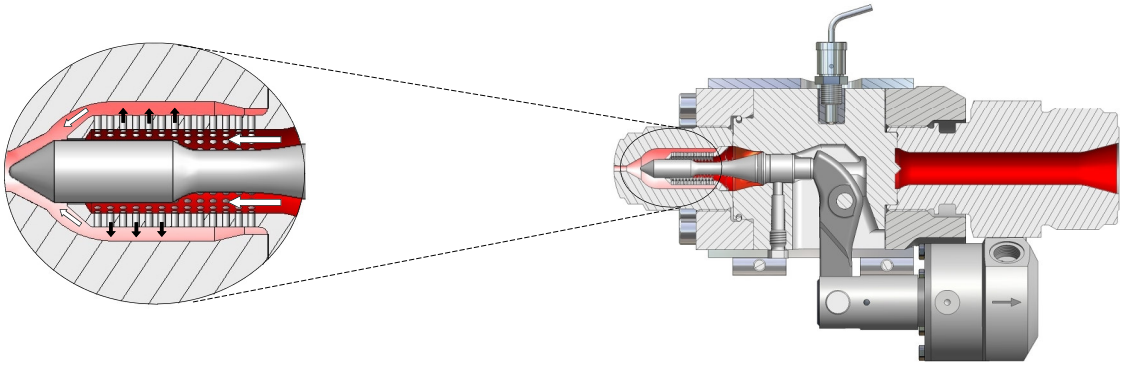
Optional Extras

Filter → preventive strategy

Keep gates in hot runners free of foreign bodies or filter out unwanted fragments when using re-grinded material. We offer a low pressure drop screen filter.
The following filter bore sizes are available from stock:

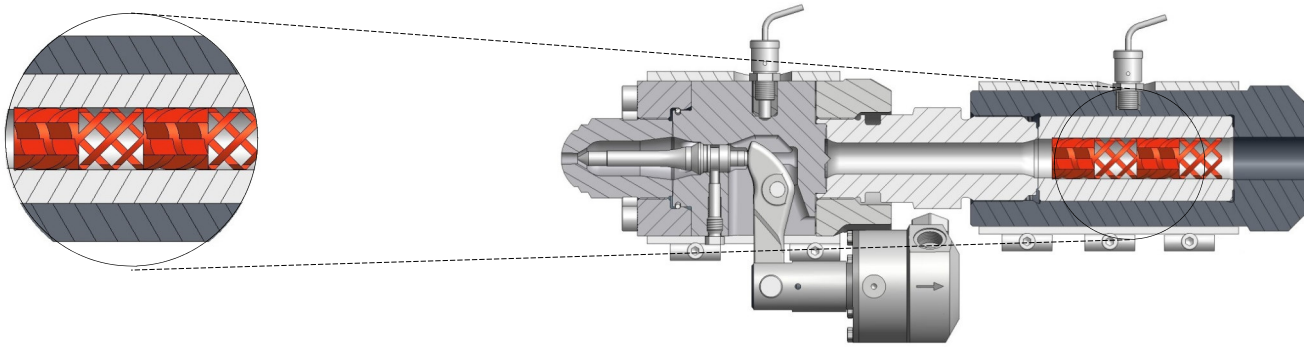
Nozzle size	HP0	HP1	HP2
Filter hole ø	0.7mm	0.9mm	1.3mm

More information under **Optional Extras, Melt filter**



Mixer → improved quality on injection molded parts

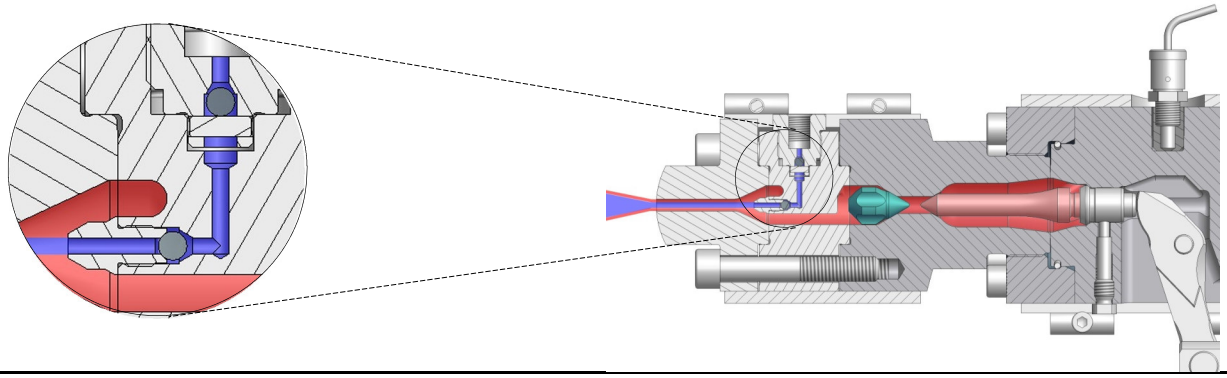
A **homogenized** melt (in colour and temperature) reduces the reject rate and produces a considerable improvement in the quality of the molded part. The installation of the mixer takes place either before or after the nozzle. We use a static mixer.



GIT (Gas Injection Technology) → cycle time, quality on injection molded parts

Gas is injected through the gate core. To use the nozzle for the GIT process, the tip is changed. A special valve closes the gas feed area to make it completely polymer-sealed.

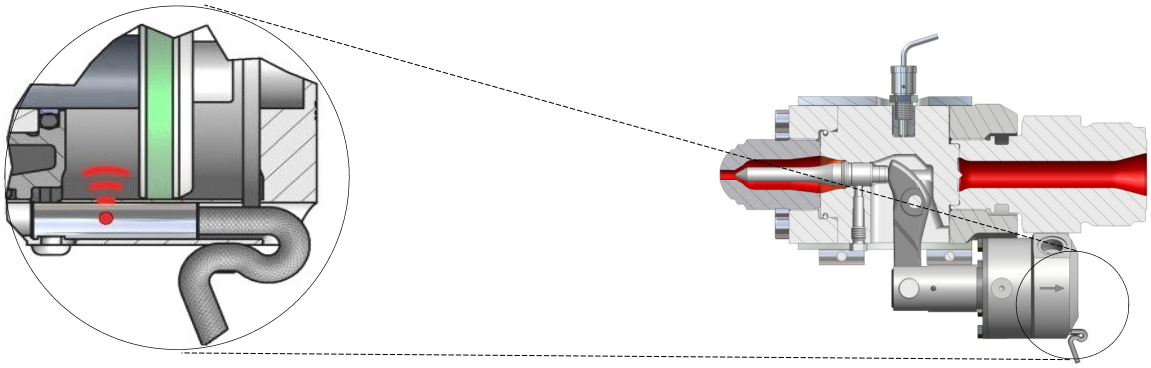
More information under **Open machine nozzles, type GM**



Position sensor for actuator → process control

A temperature resistant cylinder houses the sensor which detects the position of the piston ensuring that the nozzle is in an “open“ or „closed“ position.

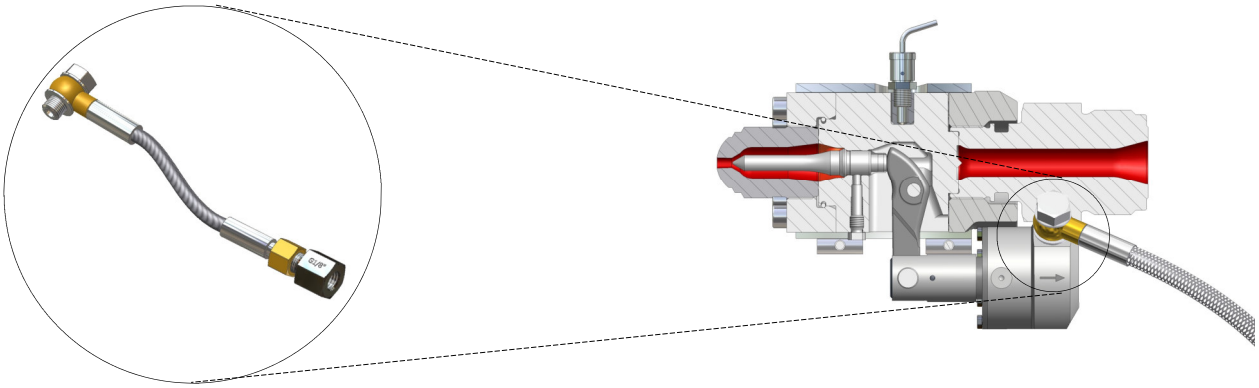
More information under **Optional Extras, Piston position sensor type SHE**



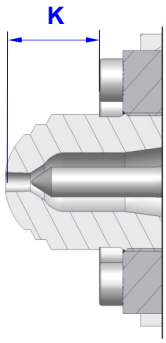
Flexible actuator feed → supports actuator performance

Our pneumatic and hydraulic actuators rotate slightly and system-dependently during the piston stroke. If this pivotal movement is restricted, the piston rod and seals will wear out in a short period of time. Therefore it is important to use flexible piping.

More information under **Optional Extras, Flexible actuator feed**

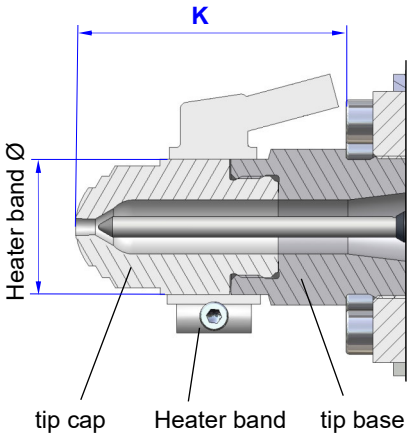


Machine shut-off nozzle, type HP



Tip types

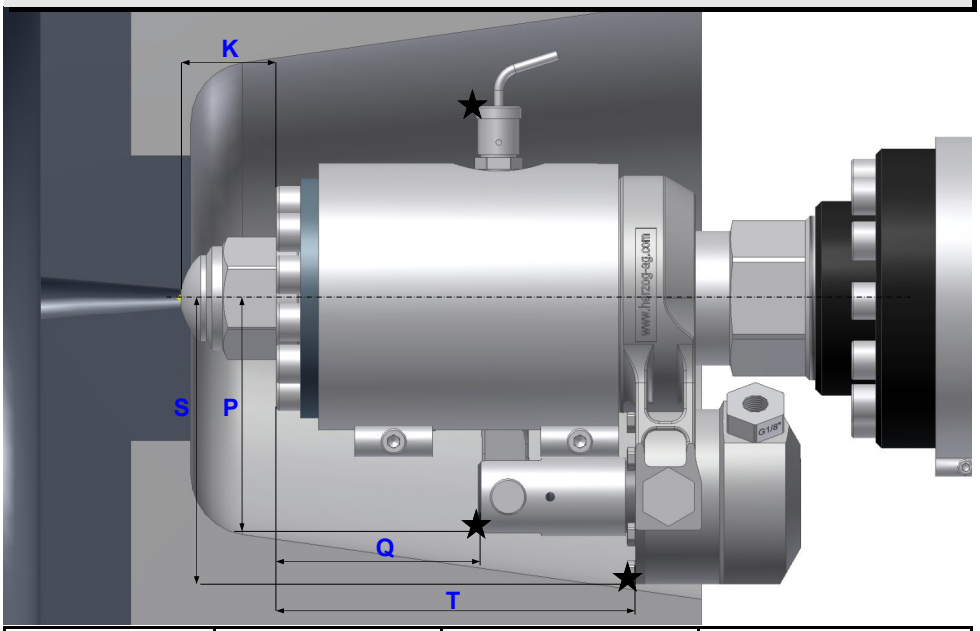
One-piece tip: two lengths (mm)	**HP0**		**HP1**		**HP2**	
K (length)	**24***	40	**32***	50	**50***	80
Heater band (Ø x length)	—	Ø26 x 16	—	Ø35 x 18	—	Ø50 x 30
*** Standard tip** (included in the base model)						



Two-piece tip (mm)	**HP0**	**HP1**	**HP2**
K (length)	60, 80, 100, 130, 160	80, 100, 130, 160, 190	100, 130, 160, 190
Heater band (Ø x length)	Ø35 x **K**-40mm	Ø40 x **K**-55mm	Ø60 x **K**-70mm
Other lengths are custom manufactured and available on request. **Note:** Extended tip lengths require additional heating with seperate regulation.			

★ The stars in the graphic represent exposed areas of the nozzle. The required area should be checked in the machine platen.
In certain circumstances a longer tip can avoid collision. In this case the tip dimension **K** would be adjusted.
For standard sizes see **Tip types**.

Risk of collision by diving into the mold



Dimension (mm)	**HP 0**	**HP 1**	**HP 2**
P	70	77	96
Q	51	64	92
S	84	95	124
T	87	117	173
K	Tip length variable to immersion depth (see **Tip types**)		

Machine shut-off nozzle, type HP

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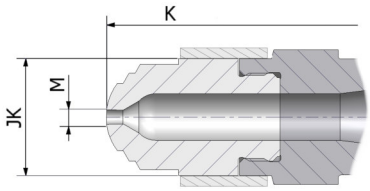
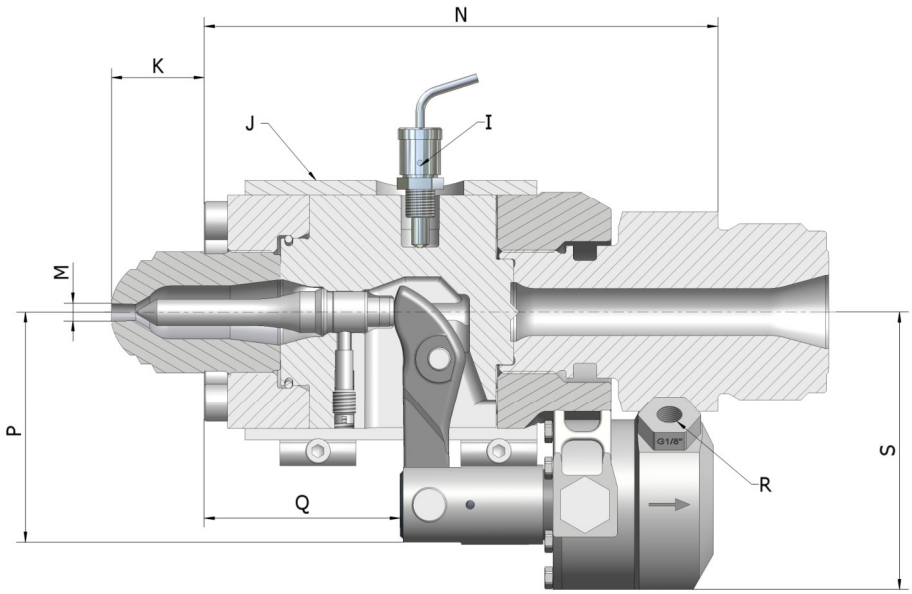
Data sheet - machine needle shut-off nozzle, type HP pneumatically / hydraulically controlled

Operating data	**HP0**	**HP1**	**HP2**
max. injection rate cm^3 / s based on Polystyrol (PS)	500	1600	3500
approx. screw diameter (mm)	bis 50	50 – 120	ab 120
flow channel cm^3	20	50	130
max. contact force (kN)	70	120	180
smallest nozzle orifice (mm) **M** at max. injection rate	Ø 3	Ø 5	Ø 8
max. back pressure	600 bar	600 bar	600 bar
• For higher back pressure (melt precompression) or closing against solid melt pressure (physical foaming) please contact us for more information.			
max. injection pressure / temperature	3000 bar / 400°C	3000 bar / 400°C	3000 bar / 400°C

Two-piece tip





Standard dimensions (mm)

Key	**Description**		**HP0**	**HP1**	**HP2**
K	tip length; one-piece		**24***, 40**	**32***, 50**	**50***, 80**
	tip length; two-piece		(60, 80, 100, 130, 160)**	(80, 100, 130, 160, 190)**	(100, 130, 160, 190)**
	*Standard tip included in base model. **Optional tip dimensions. Other tip dimensions custom manufactured.				
M	max. orifice (cylindrical)		6	8	11
N	body length		138	176	244
I	temperature sensor		Typ J (FeCuNi)		
J	heater band (custom made)		ø60*80, 600W / 230V	ø80*100,1250W / 230V	ø115*140, 2000W / 230V
JK	tip heater band	one-piece tip	Ø26 x 16	Ø35 x 18	Ø50 x 30
		two-piece tip	Ø35 x K-40	Ø40 x K-55	Ø60 x K-70
P			70	77	96
Q			51	64	95
R	pneumatic		G1/8“		
	hydraulic / water cooling		G1/4“ / G1/8“		
S			84	95	124

Technical modifications reserved. For orders or enquiries please fill out the **Dimension sheet**.

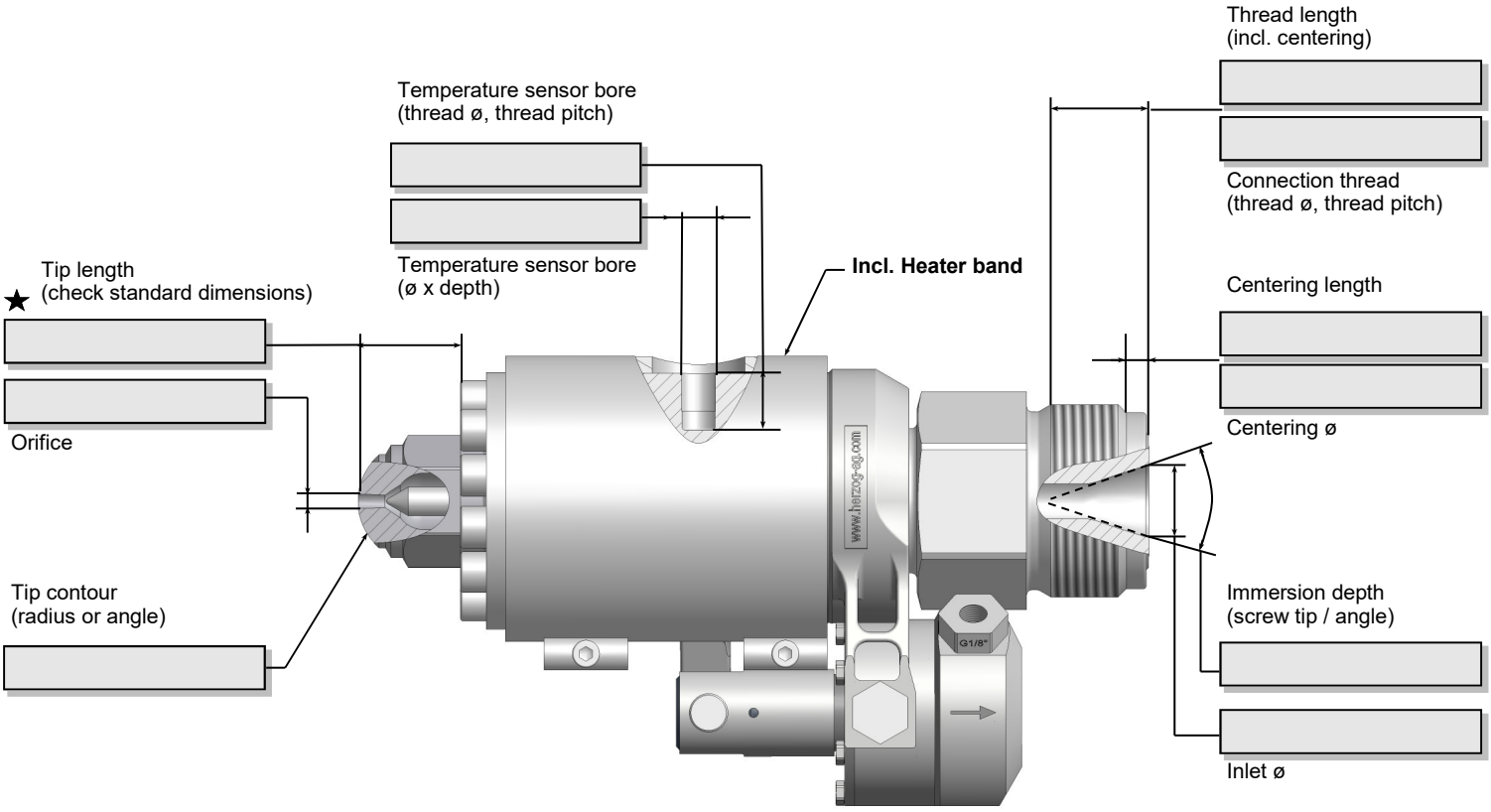
Machine shut-off nozzle, type HP

herzog®

Dimension Sheet for enquiry		or order		Shut-off nozzle type HP, pneu. / hydr. operated

Company:	Contact person:
Street:	Tel.:
City / Zip:	Fax:
Land:	E-Mail:

★ Standard dimensions, see **Datasheet.** Measurements in mm.



Nozzle size

- ☐ **HP0** (up to 500 cm³/s with PS)
- ☐ **HP1** (up to 1600 cm³/s with PS)
- ☐ **HP2** (up to 3500 cm³/s with PS)

Actuation

- ☐ pneumatic (integrated)
- ☐ hydraulic (integrated)
- ☐ none (machine side)

Screw Ø

Processed material

Options

Temperature sensor - type J(FeCuNi) cable length 2m	**Yes**	☐
Tip with abrasion protection (above 30% fillers)	**Yes**	☐
Corrosion protection; recommended for additives such as flame retardants	**Yes**	☐
Filter (HP0 ø0.7mm, HP1 ø0.9mm, HP2 ø1.3mm)	**Yes**	☐
Mixer	**Yes**	☐
Gas injection tip, type GM	**Yes**	☐
Piston position sensors, type SHE	**Yes**	☐
Flexible actuator feed pipes	**Yes**	☐

Special applications

Physical foaming (for example MuCell®)	**Yes**	☐
Chemical foaming	**Yes**	☐

Customer information:
We need additional information for requirements which vary from our standard range e.g. drawing sample.
Our customer services will be pleased to help you.